IOWA energy BULLETIN

Department of Natural Resources
Vol. 27, Num. 3, Autumn 2001

Iowa Company Hog Wild for Alternative Fuel

At least one Iowa company has found a way to turn waste materials into fuel, and is saving money and helping the environment in the process.

The Marshalltown-based Swift and Co., a subsidiary of ConAgra Foods, is a hog processing plant with a 15,000-head-per-day capacity. The meat processor began using animal fats to heat boilers in Dec. 2000.

By making the switch from natural gas to animal fat, Swift is able to save $15,000 to $25,000 in monthly fuel costs. The meat processor was motivated to make the switch at a time when natural gas prices were high and the value of animal fats depressed.

Additionally, rendered animal fats do not require further processing to be readily available as fuel sources. The plant was able to switch over to animal fat fuels at little cost with quick paybacks.

From an environmental standpoint, replacing fossil fuels with animal fat

continued on pg. 5

Energy Makes a Difference

As the nation works to recover from the tragic events of Sept. 11, Iowans can make a difference through simple energy steps. Energy use is closely tied to the nation's economy and security. Re-evaluating energy practices will help provide economic strength and stability. Here is how you can help:

Maintain normal patterns for refueling your car.

Stay calm amid any rumors about fuel shortages; there is a good chance they are false. Runs on gasoline can cause local supply challenges, even when no regional or national problems exist. Contact the attorney general's office at (515) 281-5807 if you suspect inflated prices at gas stations.

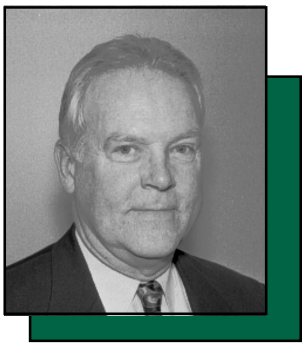
Use public transportation.

Showing confidence in the nation's transportation systems will boost the economy while reducing your own energy use.

continued on pg. 2

In This Issue.....

Message from Larry Bean



Your Government Is Prepared and Ready

The repercussions from the tragedy on September 11, 2001 are grave, diverse and far-reaching. As our nation reflects on its losses and prepares for the future, we can take heart in knowing that many things are working, and working well.

One of those areas in which Iowans and fellow Americans can have confidence is energy emergency preparedness. While energy supplies are something most consumers take for granted as always being available, your government has not.

Utility companies have comprehensive plans in place to assist their customers in the event of an emergency. A crisis situation could take the form of a severe ice storm, a serious computer glitch such as the one feared during Y2K preparations, or a major supply disruption.

The vast majority of energy problems are handled in this manner. But at the point that government assistance is needed, the DNR is the lead state agency for addressing any emergency affecting energy supply and delivery.

A network of state agencies, emergency management personnel, energy industry representatives and the governor's office is trained and ready to respond immediately to any energy crisis that could affect citizens of this state. The network will ensure strong cooperation among energy suppliers and retailers, outreach to citizens who may be at risk, communication with local, state and federal agencies, and interactions with media to make certain Iowans are well informed.

Iowa is not alone in this preparation. Every state in the nation, along with the federal government, has energy emergency plans in place and are prepared to act. We all have the same goals: to minimize the impacts on our citizens, and to keep you safe.

To all affected by the tragedy, our hearts and thoughts are with you. As we move forward, we can take encouragement in knowing that by working together we can solve any challenge facing us.

Sincerely,

Larry Bean

Larry Bean
Administrator,
Energy & Geological
Resources Division

Energy Makes a Difference

continued from pg. 1

Conserve energy.
Look at your own driving patterns and home energy use for ways to cut back energy use. Energy cost savings mean discretionary income can rise, and dollars can be spent elsewhere.

Fill up with ethanol or bio-diesel.
Iowa-grown and Iowa-produced, ethanol blends at the pump are good for car performance and great for decreasing reliance on foreign oil.

Buy energy-saving devices.
Purchasing programmable thermostats, low-flow shower heads, insulation and other energy-efficient materials will create economic activity while reducing your own utility bill.

Promote renewable energy.
Do what you can to convince state and national decision makers about the importance of renewable energy resources to the economy and to national security.

Together, we can make a difference!

The Energy Bureau. Helping You. Helping Iowa.

The DNR's Energy Bureau offers many exciting and informational programs to help Iowans adopt smart energy practices.

The Energy Bureau is the State of Iowa's core agency for creating policies and programs that decrease its reliance on imported fossil fuels. This goal is accomplished by promoting energy efficiency and the use of renewable energy resources. Through a wide array of educational, financial and marketing programs, the Bureau is working to leverage new opportunities that save money, increase profits and improve the environment.

Energy Bureau staff work closely with Iowa Gov. Tom Vilsack to promote ethanol.

For assistance or information on topics relating to energy, the DNR-Energy Bureau is here to assist you. From ethanol to building efficiency, and from education to emergency planning, the staff of the DNR-Energy Bureau can provide the expertise and information to help you.

Energy Policy
Larry Bean, Division Administrator
(515) 281-4308; e-mail:
Larry.Bean@dnr.state.ia.us
Sharon Tahtinen, Bureau Chief
(515) 281-7066
Sharon.Tahtinen@dnr.state.ia.us

Communications and Education
Julie Tack, (515) 281-8665
Julie.Tack@dnr.state.ia.us

Building Energy Management
Monica Stone, (515) 281-6361
Monica.Stone@dnr.state.ia.us

Iowa Energy Bank
Bill Blum, (515) 281-6486
Bill.Blum@dnr.state.ia.us
Chad Stobbe, (515) 242-5851
Chad.Stobbe@dnr.state.ia.us

Rebuild Iowa
Rebecca Spiess, (515) 281-5007
Rebecca.Spiess@dnr.state.ia.us

State Agency Programs
Dan Lane, (515) 281-6696
Dan.Lane@dnr.state.ia.us

Energy Data & Renewable Resources
Angela Chen, (515) 281-4736
Angela.Chen@dnr.state.ia.us

Agricultural Energy, Emergency Planning, Residential Programs
Heather Silberhorn, (515) 281-7015
Heather.Silberhorn@dnr.state.ia.us

Wind, Biomass, Solar and Ethanol
Jennifer Moehlmann,
(515) 281-8518
Jennifer.Moehlmann@dnr.state.ia.us

Energy Prices and Supplies
David Downing, (515) 281-4876
David.Downing@dnr.state.ia.us

DNR Plugs Toyota Prius into Fleet

The DNR has added a Toyota Prius, a hybrid-electric vehicle that gets up to 52 miles per gallon, to its vehicle fleet.

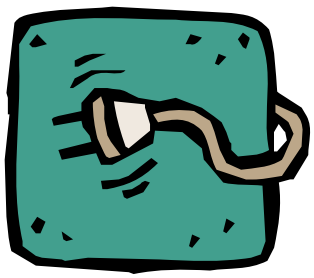
The state agency chose the Prius over other car models to demonstrate how an affordable, low-emission vehicle can benefit Iowa's environment. The four-door, high economy vehicle also will help reduce agency fuel expenses.

The Prius gets 52 miles per gallon (mpg) in the city and 45 mpg on the highway by using an electric motor to assist the gasoline engine for maximum efficiency, allowing the vehicle to run at steady, efficient rates. Electric batteries are recharged during the braking process, so "plugging in" the car is not needed.

According to the DNR's Air Quality Bureau, nearly half of all air emissions in Iowa come from vehicle exhaust. The Prius emits half that of typical passenger cars and is a certified SULEV, or super ultra-low emission vehicle under U.S. EPA guidelines.

Besides staff business trips, the Prius will be used to promote clean air and energy conservation at environmental events, schools and workshops.

For more information, contact Julie Tack at (515) 281-8665; e-mail: Julie.Tack@dnr.state.ia.us



Waste Not, Want Not:
Turning Waste into Ethanol

As demand for ethanol surges across the nation, so is a growing interest in alternative feedstocks for the renewable fuel. Researchers are working diligently to find inexpensive and plentiful resources to supplement corn, the single largest resource used to produce ethanol. One compelling alternative is to turn waste into fuel.

Biomass to Gas

As the ethanol industry develops ways to convert cellulosic materials – such as grasses, energy crops and other plant materials – into ethanol, Iowa's waste streams provide an attractive opportunity for new sources.

In 1998, more than 150,000 tons of wood residues were disposed of in Iowa landfills, representing about 7 percent of the solid waste landfilled in the state. Additionally, agricultural, forest and mill residues could be diverted to the ethanol industry as inexpensive and readily available resources.

According to a 1999 national report about biomass, Iowa has more than 24 million dry tons of cellulose resources available from waste including:

- 23.9 million dry tons of agricultural residues such as corn stover and wheat straw;
- 280,000 dry tons of urban wood wastes such as yard trimmings, pallets, wood packaging, and other commercial and household wood wastes;
- 158,000 dry tons of mill residues such as bark, coarse residues (chunks and slabs), and fine residues (shavings and sawdust); and
- 135,000 dry tons of forest residues such as logging residues; rough, rotten, and salvable dead wood; excess saplings; and small pole trees.

"Iowa has the potential to produce nearly 2.5 billion gallons of ethanol from current waste materials."

Given that one ton of biomass produces roughly 100 gallons of ethanol, Iowa has the potential to produce nearly 2.5 billion gallons of ethanol from current waste materials, or slightly more than the entire U.S. ethanol production in 2000.

Scenario for Success

A recent study completed for the DNR, *Prefeasibility Study: Production of Ethanol from Biomass in Iowa*, found that a waste-to-ethanol processing facility could be viable in Iowa today, assuming enough cellulosic feedstock is available at $15 per ton. At that price, the 1999 study estimated there would be 172,000 dry tons of urban wood waste and 2,000 dry tons of mill residues available, more than enough to sustain a 10 million gallon per year facility.

Currently, the high price of enzymes used to convert the cellulosic materials is constricting the market viability of waste-to-ethanol and other cellulosic materials, but continued research should decrease prices rapidly. As enzyme prices decline, production plants will be able to pay more for feedstocks, which will greatly increase the options available.

For more information about ethanol production in Iowa, contact Jennifer Moehlmann with the DNR at (515) 281-8518; e-mail: Jennifer.Moehlmann@dnr.state.ia.us

Livestock Manure as an energy source

A new study sponsored by the DNR has found that Iowa's livestock waste has the potential of supplying enough energy for 160,000 homes per year through methane energy recovery.

With federal and state data about Iowa's livestock industry, the study used Geographic Information Systems to evaluate the amount of methane generated from animal waste in Iowa. Anaerobic digesting systems can trap methane to be converted into electricity and heat. Benefits include electricity generation, odor control and avoided air emissions.

According to the study, more than 24,000 tons of manure produced daily from feedlot cattle, dairy cows, swine, poultry, and turkeys could be converted to 32 million Btus per year, or almost 3 percent of the state's electricity needs.

The 24,000 tons of livestock waste produced daily in Iowa could meet 3 percent of the state's energy needs.

The study found that economic incentives such as no-interest loans help make methane energy recovery more economically feasible for animal confinement operations.

Barriers to the technology include the low economic return on systems, difficulties in obtaining financing to build systems, and the low rate paid for the sale of excess electricity.

For more information on the waste and methane energy recovery study, contact David Downing with the DNR at (515) 281-4876; e-mail: David.Downing@dnr.state.ia.us

Iowa Company Turns Fat to Fuel

continued from pg. 1

can reduce air emissions. According to air quality experts, animal fats burn almost as cleanly as natural gas and at approximately the same BTU-value as fuel oils.

Swift is burning the alternative fuel to heat boilers that produce steam for use in the slaughter and fabrication processes. According to the company, steam heat is an important element of facility sanitation and overall food safety intervention systems.

ConAgra Foods honored the Swift-Marshalltown plant with $5,000 to be used on a community environmental project for its innovation in energy savings. The parent company is looking at the possibility of how other plants' energy needs could be met with animal fats and vegetable oils.

Swift and Co. is one example of Iowa leadership and innovation in smart energy practices. For more information about alternative resources, contact Jennifer Moehlmann with the DNR at (515) 281-8518; e-mail: Jennifer.Moehlmann@dnr.state.ia.us

Did You Know...

Methane is produced during the decomposition of organic material.

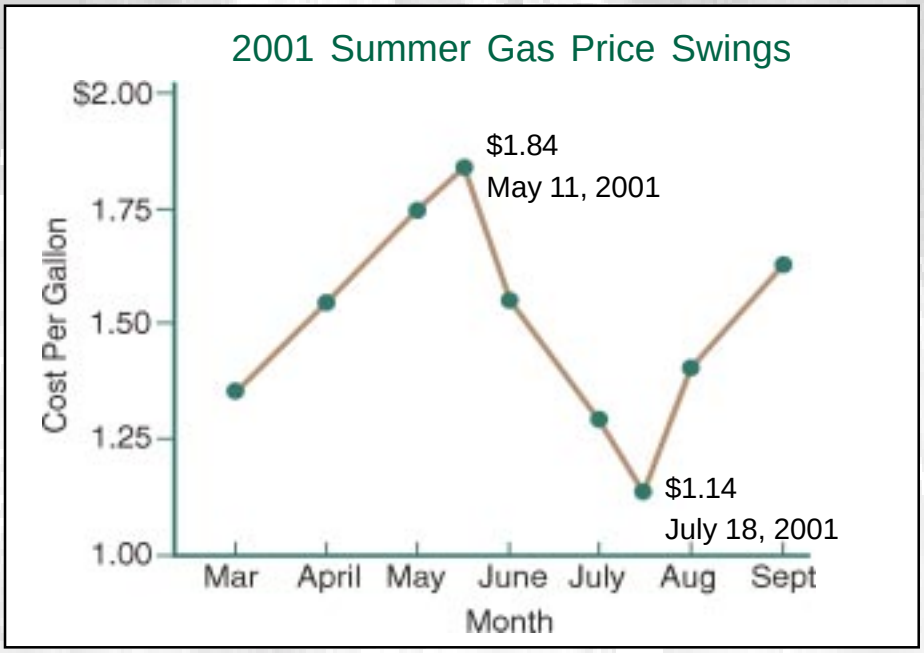
As waste material breaks down at landfills, it can produce gas for up to 30 years. Iowa's landfills possess the electricity generation potential of 20 MW, enough power for 15,000 homes and the emissions avoidance equivalent of 150,000 vehicles taken off the road.

Today, two landfills in Iowa -- Bluestem Solid Waste Agency of Cedar Rapids and Metro Waste Authority of Des Moines -- together produce 7.5 MW of electricity from captured landfill gas.

Analyst's Angle

By David Downing, Energy Data Analyst

7 Reasons for Volatile Gas Prices & What We Can Do



As the 2001 summer driving season closes, motorists can view three months of drastically fluctuating gasoline prices – from a low of $1.14 to a high of $1.84 per gallon – as a sign of things to come. As with any product, gasoline prices are dictated by demand levels relating to the amount of supply. Many of the challenges facing the Midwest are because supply is not able to keep pace with demand. Here are seven reasons for volatile prices in the region, and solutions to help create more market stability.

Seven Challenges

1. Growing motor fuel demand. The Midwest region* consumes 28 billion gallons of gasoline annually, which is 21 percent of all gasoline consumed in the United States. Regional gasoline consumption has risen 47 percent in the last decade and is projected to grow 24 percent by 2020.

2. Increasing regional motor fuel expenditures. Midwest states spent $45 billion on gasoline and $14 billion on diesel fuel in 2000. Gasoline expenditures are projected to increase an average of .6 percent each year through 2020. As spending for gasoline increases, discretionary spending declines.

3. Lack of regional and national refining capacity. The single largest factor affecting gas prices is supply from the nation's refineries. The United States is trending to fewer, but larger refineries, with the number declining from 194 in 1990 to 156 refineries today. Meanwhile, the nation's demand is "bumping up" against production capacity. If any disturbance occurs at a refinery, such as a fire or mechanical failure, the effect on gasoline prices is immediate.

4. Number and types of motor fuels. Midwest pipelines often transport more than 60 different petroleum products in one or two pipelines. The large number of product types adds a level of complexity to production, distribution and storage of gasoline.

5. Lower fuel economy. National fuel economy in vehicles is at a 20-year low. For example, within the "light vehicle" category for model year 2000, average fuel economy was 1.9 mpg lower, or 7 percent, than the peak value of 25.9 mpg achieved in 1988.

6. Increased speed limits. The average light-duty vehicle loses 17 percent of its fuel efficiency capability when driving increases from 55 to 70 miles per hour.

7. Lack of knowledge on the part of consumers, businesses, and government about the role energy plays in economic and environmental decisions.

Seven Solutions

1. Alternative fuels. The use of renewable fuel blends such as E-10, E-85 and soy diesel displaces imported crude oil and refined products. Expenditures for renewable fuels stay in the regional economy and reduce dependence on other regions and nations.

2. Technology. New vehicle technologies reduce fuel consumption. Hybrid gas-electric vehicles

continued on next page

*includes IL, IN, IA, KS, MI, MN, ND, OH, SD, WI

Iowa State University Receives $7 Million for Bio-Energy Research

The U.S. Department of Energy has awarded Iowa State University nearly $7 million to conduct three bio-energy research projects. The funding is part of the DOE's Agriculture Industry of the Future program, which works to develop energy efficiency and renewable energy in industrial sectors. The funding will go to the following areas:

- **$1.57 million** to ISU's Department of Mechanical Engineering to develop harvesting equipment for sugars from crop residues.
- **$5 million** in a shared project between B/MAP of Harlan, Iowa and ISU Extension/Wallace Foundation for Rural Research and Development, to develop collection, commercial processing and use of corn stover in energy applications.
- **$375,000** to ISU's Center for Sustainable Energy Technologies to develop a graduate-level education and training program in biobased products.

The Industries of the Future program had previously awarded $200,000 to the DNR to conduct a joint project with ISU to develop energy efficiency in the metal casting and agricultural sectors.

For more information, contact Angela Chen at (515) 281-4736; e-mail: Angela.Chen@dnr.state.ia.us

Volatile Gas Prices

continued from pg. 6

such as the Toyota Prius and Honda Insight prove advanced technology vehicles are practical and reliable. Fuel cell vehicles are currently being tested and could be introduced by 2003.

3. Increased refinery capacity. Incentives to spur new refinery construction and additional pipeline capacity can help alleviate supply concerns so the region can take proactive steps rather than reactionary.

4. Reduction in the number of motor fuel blends. A reduction in the number of reformulated gasoline blends for the entire nation would decrease refining costs and free space in the pipeline system.

5. CAFÉ standards. The technology to reduce vehicle fuel consumption is available, but not always implemented. Reward manufacturers who meet or exceed Corporate Average Fuel Economy goals established by the federal government.

6. The "Three E's" in proposed legislation. Energy, economic, and environmental impacts should be studied carefully before passing any new legislation regarding the motor fuels market.

7. Energy education. An understanding of the energy resources and markets that affect the Midwest will help governments, schools, and the private sector educate consumers on how to save energy and stabilize markets.

For more information about gasoline prices, contact David Downing at (515) 281-4876; e-mail: David.Downing@dnr.state.ia.us

Energy News You Can Use.
www.state.ia.us/energy

IOWA energy BULLETIN

Published by the Energy and Geological Resources Division, Iowa Department of Natural Resources.

Jeff Vonk, Director
Larry Bean, Administrator, Energy and Geological Resources Division
Sharon Tahtinen, Energy Bureau Chief
Monica Stone, Executive Officer, Building Energy Management
Angela Chen, Executive Officer, Energy Planning and Technology Transfer
Julia C. Tack, Editor
Katie Nevins, Energy Information Intern

This material was prepared with the support of United States Department of Energy grant number DEFG47-80CS769097.
However, any opinions, findings, conclusions or recommendations expressed herin are those of the authors and do not necessarily reflect the views of the DOE.

For additional copies or to comment, please write or call:
Editor, Iowa Energy Bulletin
Wallace Building
Des Moines, Iowa 50319-0034
(515) 281-8665
(515) 281-6794 (fax)
E-Mail:
Julie.Tack@dnr.state.ia.us

Calendar of Events

Oct. 16-17. Ames, IA. *The Future of Renewable Energy Generation in Iowa*. Gateway Conference Center. For more information contact Mark Edelman at Iowa State University, (515) 294-3008.

Oct. 16-17. Atlantic City, NJ. *Energy and Environmental Technologies*. Go to www.eetech.org

Oct. 24. Des Moines, IA. *The Value of Energy Efficiency.* Iowa Association for Energy Efficiency Annual Conference. Contact Patti Cale at (515) 289-1999 or e-mail: energy@iamu.org

Oct. 29-30. Berkley, CA. *American Council for an Energy Efficient Economy National Conference on Energy Efficiency and Reliability.* Contact Martin Kusler at (517) 655-7037 or e-mail at mgkusler@aol.com

Oct. 31-Nov. 1. Des Moines, IA. *Climate Change and the Insurance Industry.* Learn how building energy code compliance can reduce the health and property risks associated with global climate change. Targeted to the insurance industry, building and real estate professionals, and the general public. Contact Craig Stark with the Iowa Department of Natural Resources at (515) 281-4739 or e-mail: Craig.Stark@dnr.state.ia.us

Nov. 27. Lisle, IL. *Wind Workshop and Exhibition*. Review new wind technologies and opportunities, Illinois wind resources, and technical and policy issues. For registration information, contact Technical Resources International at (301) 897-7481.

October is Energy Awareness Month.

Save Energy: Help the Economy. Preserve the Environment.

IOWA DEPARTMENT OF NATURAL RESOURCES
Wallace State Office Building
Des Moines, IA 50319-0034

BULK RATE
U.S. POSTAGE
PAID
DES MOINES, IA
PERMIT NO. 1195